

ALIYEV, C.A., skademik; IZYUNOV, A.Z., red.

[Brown forest soils; in regions of the eastern part of the Greater Caucasus] Korichnevye leanye pochvy; v predelakh vostochnoi chasti Bol'shogo Kavkaza. Baku, Izd-vo AN Azerbaidzh.SSR, 1965. 111 p. (MIRA 18:11)

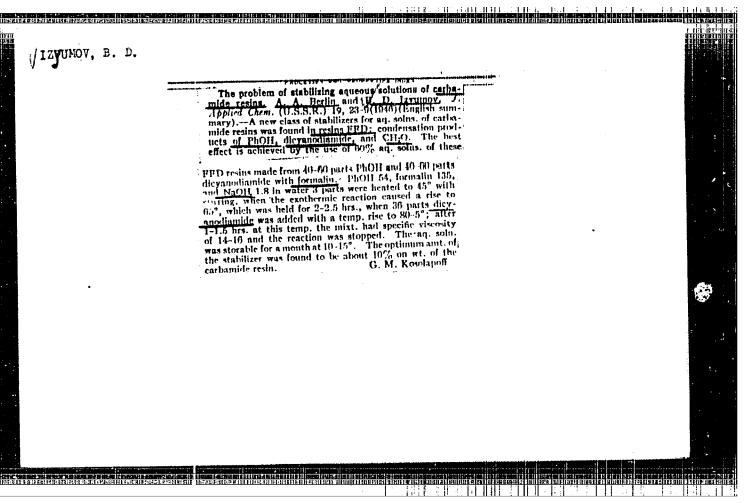
1. Akademiya nauk Azerbaydzhanskoy SSR (for Aliyev).

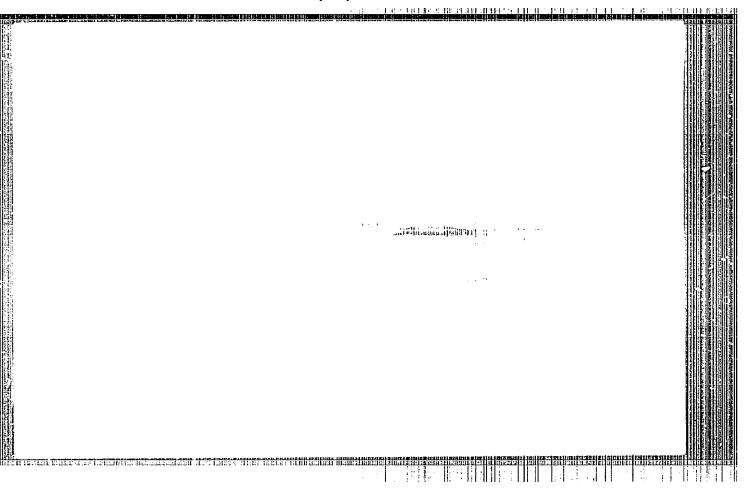
IZYUMOV, V.N.; KOPOSOVA, T.L.; Prinimali uchastiye: KOKOVA, Z.P.; BUNTOVA, V.I.

Synthesis of alkyd resins modified by monotasic acids.

Lakokras. mat. i ikh prim. no.5:2-5 '63. (MIRA 16:11)

1. Yaroslavskiy tekhnologicheskiy institut.





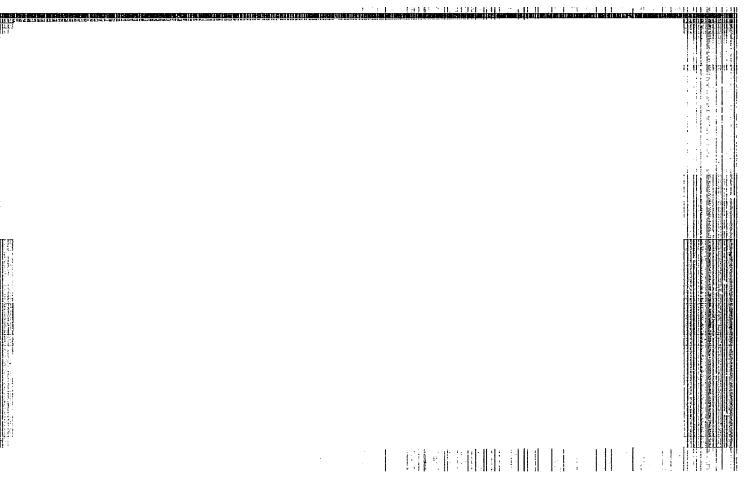
I Julius Vy you als USSR/Chemical Technology. Chemical Freducts and Their Application - Silicates. Glass. Ceramics. Birders, 1-9 Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 5335 Author: Kudryashev, I. T., Krymmer, B. D. Institution: None Title: Imparting Hydrophobic Properties to Gelloder Constate Original Publication: Beton i zhelezobetca, 1935 Mr. 8, 290-293 Abstract: To decrease water absorption of collular component At is recommended to apply to their surface, with a paint brush, water soluble organic silicon compounds (SC) --- wethyl- and athyl addicaments of sodium (MSG-9 and ESG-9), mixed with finely dispensed filler (sement of ground sand). Concentration of the squeous solution of SC must be 2-4%. The surfaces being thus impregnated used not be predried. A

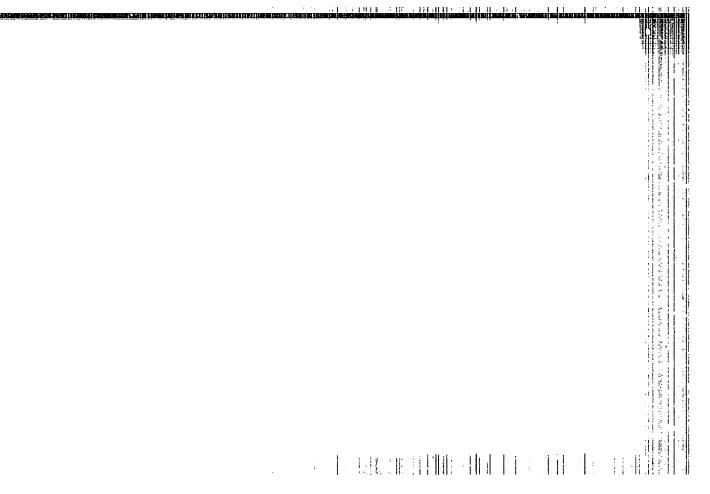
of application of SC are stated.

Card 1/1

APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619410016-3"

considerable effect of the SC becames manifest unly after a short duration moistering of the anticles (620 hours). Aquabus solution of SC can be mixed with water schuble paints. The possible fields





8/081/41/030/001,019/024 B101/1908 Inyumov, B. D., Pakhomov, V. I., Panfilovo, I. M. AUTFORS: TITLE: New types of organosilicon plantics Referativnyy zhurnal. Khimiya, no 5. 1961. 619, abstract PERIODICAL: 5038 (5P38) ("Vestn. tekhn i ekonom. inform. Nati in-t tekhn. ekon. issled Gos kom-ta Sov Min SSSR po khimii", 1959. no. 3 (15), 3-6) TEXT: A short characteristic of organosilican compounds is given: KMK-9 (KMK-9) molding powder, KMK-218 (KMK-218), KMC-9 (KMS-9) molding materials, and CKN-9 (SKP-3) glass textolite (technological, physicc-chemical, physico-mechanical, and dielectric properties, temperature-dependence of dielectric and mechanical characteristics). [Abstracter's note: Complete translation.] 1.21 Card 1/1

S/081/61/000/014/028/030 B105/B202

AUTHORS:

Izyumov B. D., Pakhomov V. I., Gol'dshteyn Zh. I.

TITLE:

Water soluble hydrophobic organosilicon liquids

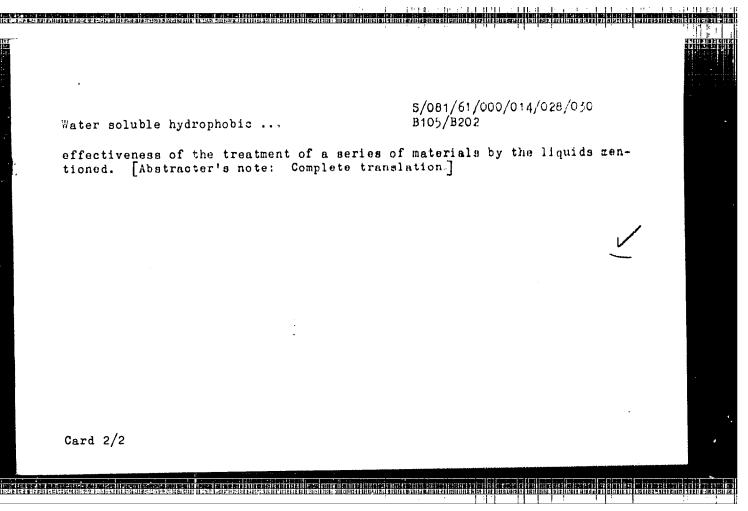
PERIODICAL:

Referativnyy zhurnal. Khimiya, no. 14, 1961, 619, abstract 14N755 (Vestn. tekhn. i ekon. inform. N.-i. in-t tekhn.-ekon. issled. Gos. kom-ta Sov. Min. SSSR po khimii, 1959,

No. 5 (17), 45-48)

TEXT: The authors discuss the properties and the fields of application of water-soluble organosilicon polymers which are used to waterproof textile products, paper, carton, leather, and building materials. Materials are waterproofed by means of aqueous solutions of the liquid FMC-9 (GMS-9) in the presence of catalysts (NH₃, CH₃COOH, H₂O₂, triethylamine, alum etc.) and by subsequent heat treatment (5-10 min at 130-150°C) for the fixation of the foil. The liquids MSG-9 and ES-9 are aqueous solutions of sodium methyl and ethyl siliconate. They are applied by a brush, a spray or by immersion, and subsequently dried on air. The authors give data on the

Card 1/2



S/661/61/000/006/072/081

Thermostable silico-organic glues

D247/D302

lico-organic glues tested were found to last for 100 hours at 200 - 350°C, 10 hours at 300 - 350°C and 10 - 20 hours at 400°C. There are 9 figures and 6 references: 5 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: R. R. McGregor, Silicones and their uses, New York, (1954).

ASSOCIATION: Nauchno-issledovatel'skiy institut plastmass, Moskva (Scientific Research Institute of Plastics, Moscow)

"APPROVED FOR RELEASE: 08/10/2001

CIA-RDP86-00513R000619410016-3

S/661/61/000/006/073/081 D247/D302

AUTHORS: Pakhomov, V. I., Izyumov, B. D. and Panfilova, I. P.

TITLE: Thermal stability and resistance of silico-organic

pressed materials to arcing

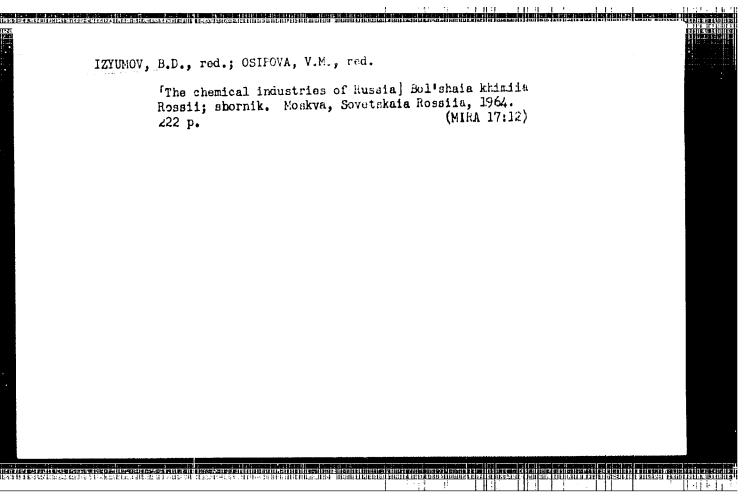
SOURCE: Khimiya i prakticheskoye primeneniye kremneorganiches-

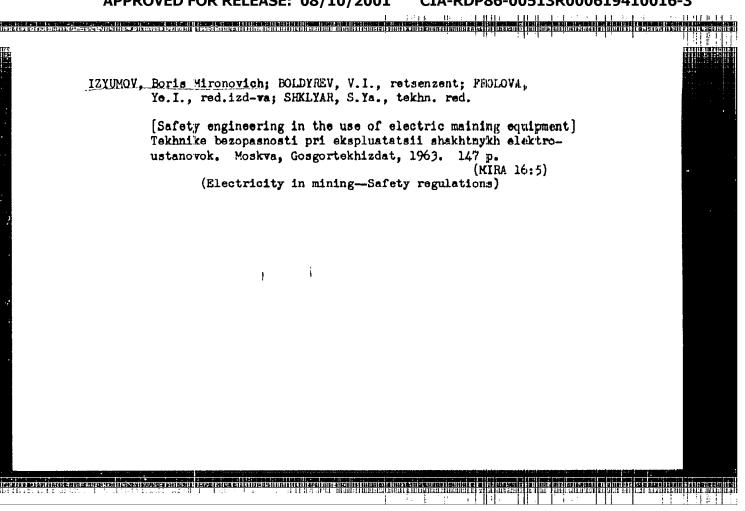
kikh soxedineniy; trudy konferentsii, no. 6: Doklady, diskussii, resheniye. II Vses. konfer. po khimii i prakt. prim. kremneorg. soyed., Len. 1958. Leningrad,

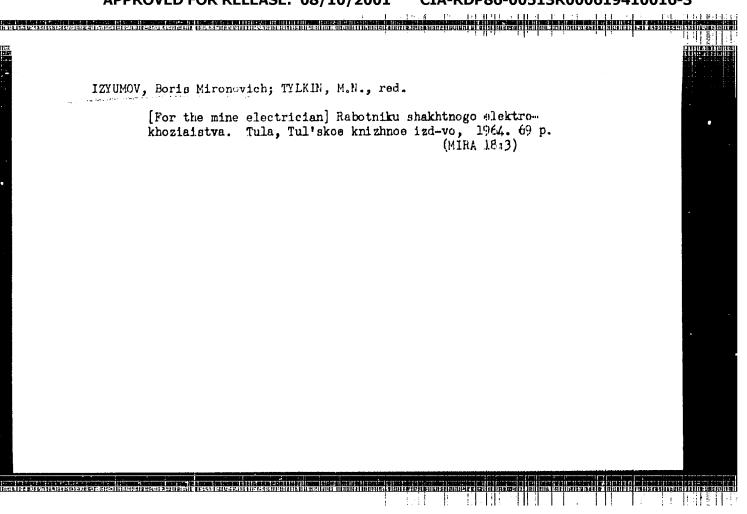
Izd-vo AN SSSR, 1961, 316-322

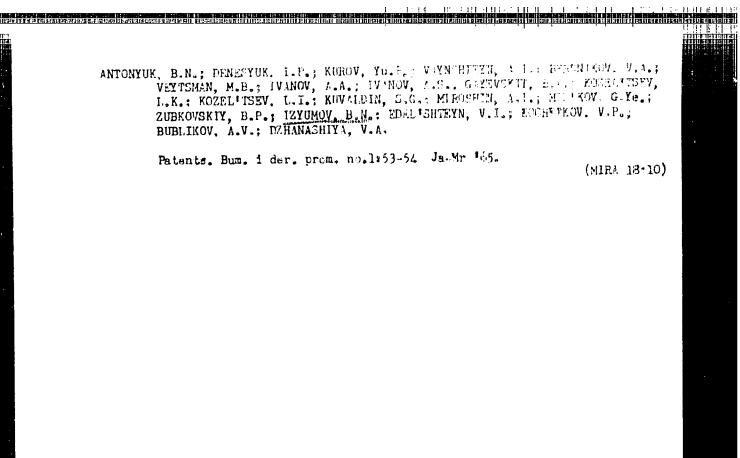
TEXT: A series of silico-organic pressed materials were examined for their stability, mechanical and dielectric properties. Their composition and uses were recorded, and also their appearance. In the discussion, in which B. A. Kiselev (Moscow) took part, particular properties of various resins were mentioned. The greatest thermal stability noted was 100 hours at 350 - 400°C and the highest limit before electrical breakdown was 18 kV/mm. There are 8 figures, 1 table and 8 references: 5 Soviet-bloc and 3 non-Soviet

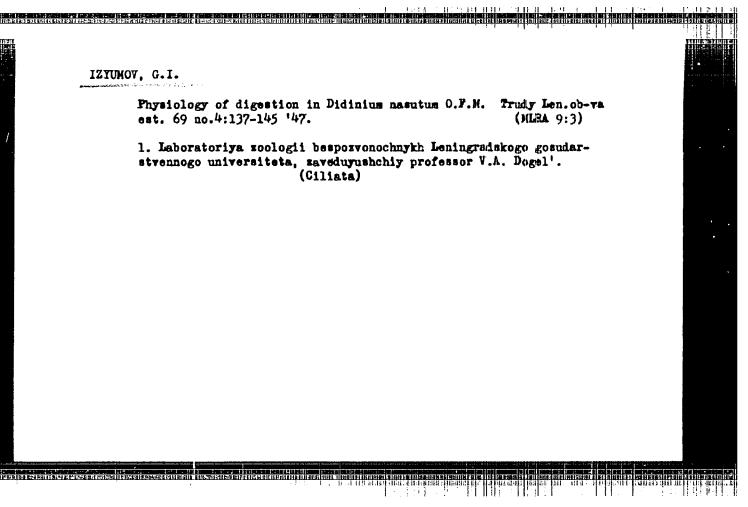
Card 1/2

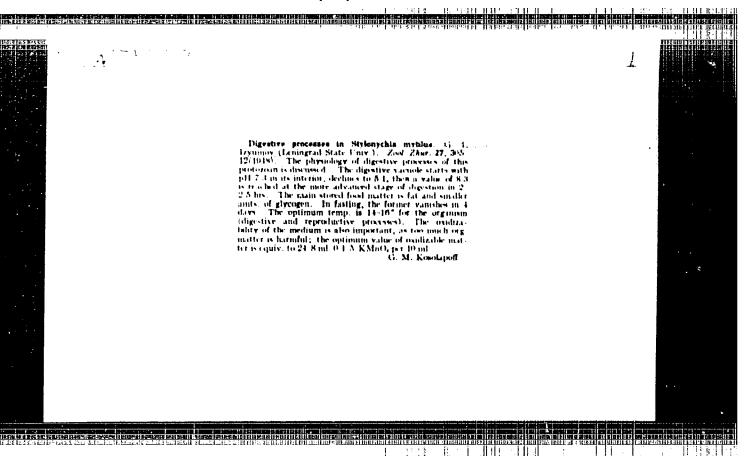












IZ	fUMOV, G.I., kand.biolog.nauk		MARKANS (PERESESSIT) AS ILICENTISA MARKANSI MARKANSI	
	Reproduction of wild animal Je 162.	ls in captivity.	Priroda 51 no.6:70-7 (MIRA 1	7 5:6)
	l. Ieningradskiy zoopark. (Animals, Habits a	and behavior of)	(Reproduction)	
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S/081/61/000/007/008/010 B107/B207

AUTHOR:

Izyumov, I. D.

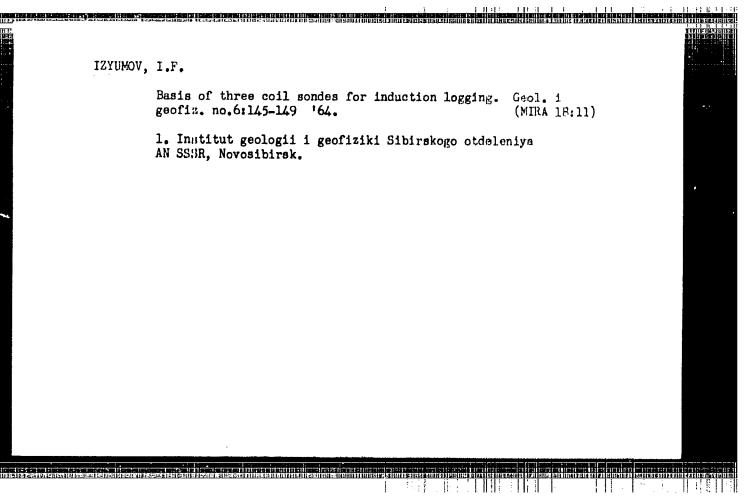
TITLE:

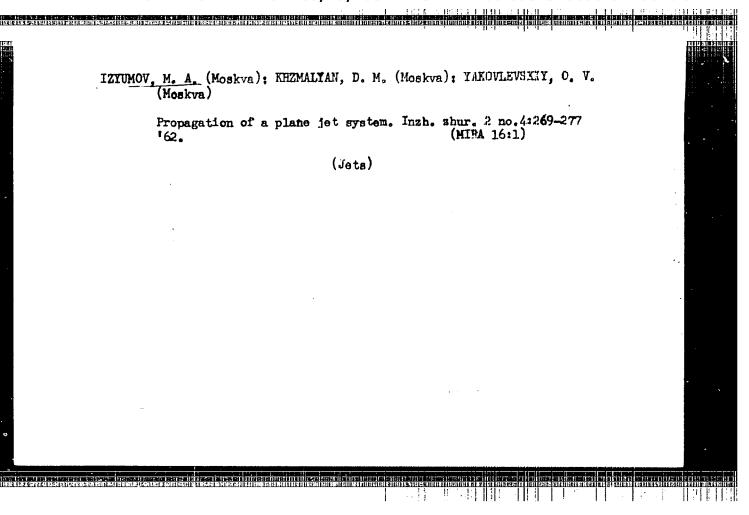
Plastics tested under conditions of tropical climate

PERIODICAL:

Referativnyy zhurnal. Khimiya, no. 7, 1961, 549, abstract 7M4 (7P4) ("Vestn. tekhn. i ekon. inform. N.-i. in-t tekhn.-ekon. issled. Gos. kom-ta Sov. Min. SSSR po khimii", 1959, no. 1(13), 25-30)

TEXT: The physicomechanical properties of standard samples were tested under the climatic conditions prevailing in the Union of Burma. The standard samples consisted of thermosetting and thermoplastic materials produced in the Soviet Union. The majority of samples were tested in the open air on a tennis court. Another portion was packed into a case and stored in a moist room which could not be aired. The third portion was dug into the ground at a depth of approximately 50 - 60 cm. Experiments showed that the properties of some materials (acetyl cellulose etrols, 2-AT-55 (2-DT-55), 2-AT-30 (2-DT-30), polyvinyl ethylal, TOK-60 (POK-60), TOB-67 (POV-67) etc.), considerably deteriorated: they became Card 1/2

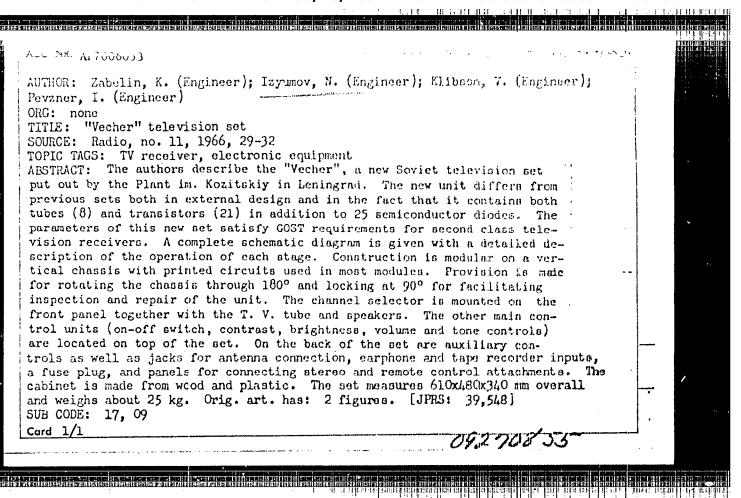


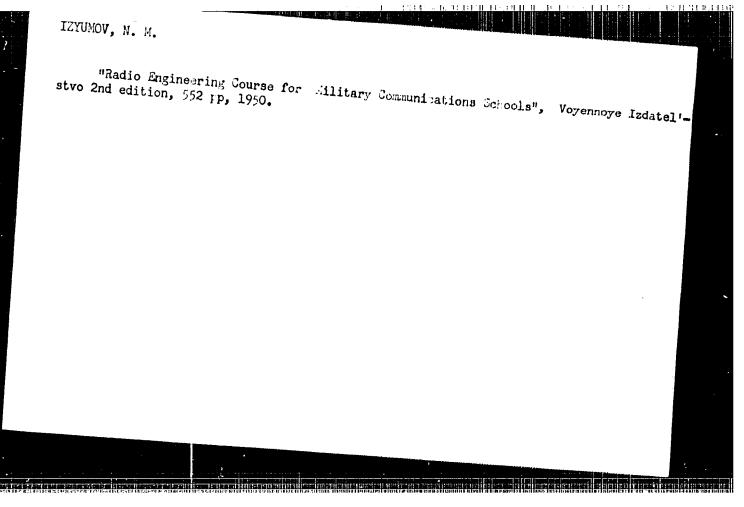


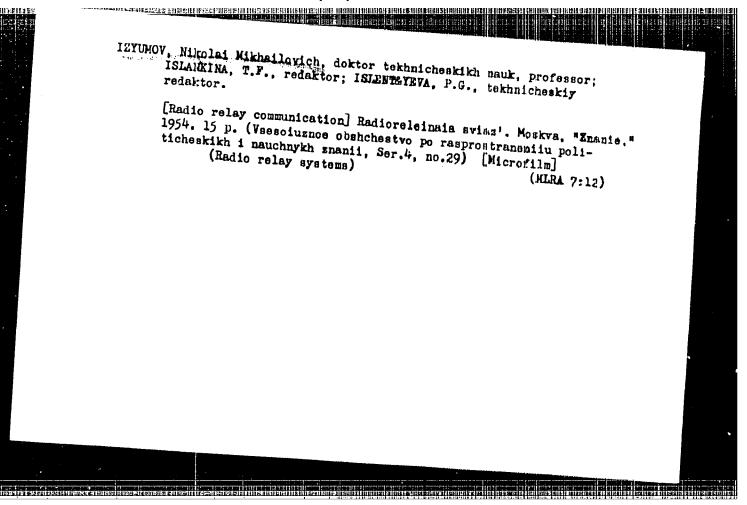
IZYUMOV, M.A., inzh.; KUTMAN, B.L.; IYAKH, V.Ya., inzh.; KHZMALTAN, D.M., kand.tekhm.nauk

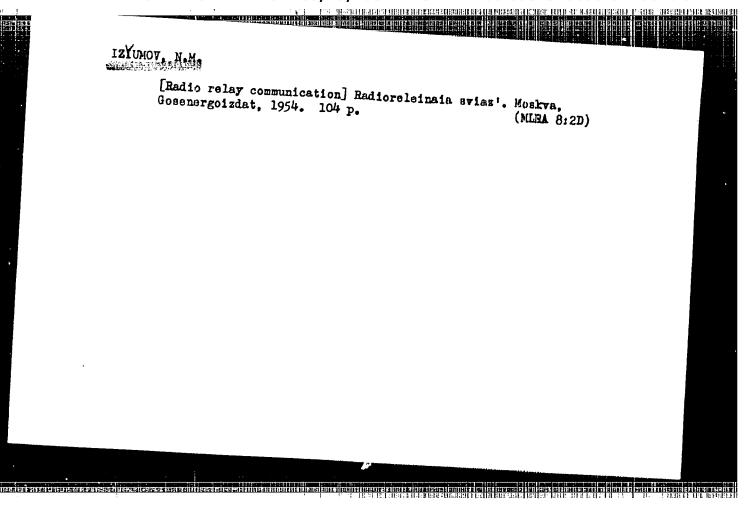
Conversion of a TKP-3 boiler to firing coal dust in plune parallel jets. Teploenergetika 10 no.2:11-14 F '63. (MIRA 16:2)

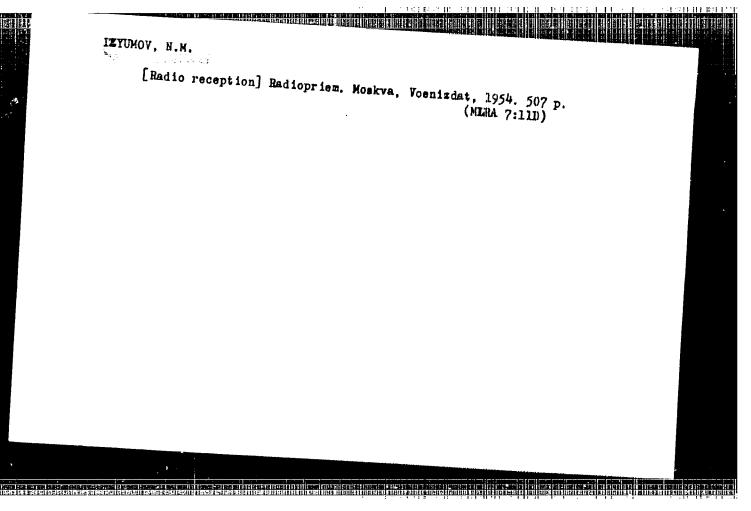
1. Upravleniye energeticheskoy proxyshlennosti Sovetef marcdnogo khozyaystva Permukogo ekonomicheskogo administrativnogo rayona i Moskovskiy energeticheskiy institut. (Boilers)



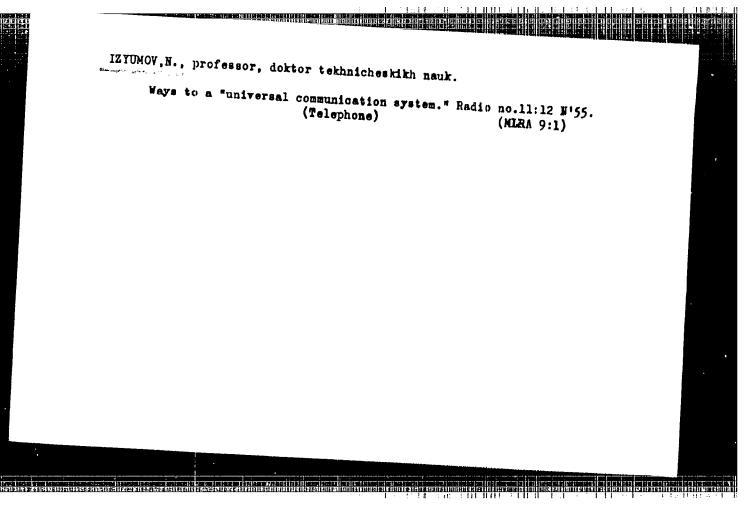








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	llaneous - Andio communication	· 斯特拉姆斯 人名英格兰 人名英格兰人姓氏格兰人名
Card 1/1	Fub. 89 - 3/32	
4	*Izyumov, N.	
Title	*Radio communication and radio entineering i	Pt that have you
Periodical	Radio 2, 4 - 5. Feb 1955	
Abstract	An outline on the history of the development	t and use of radio and radio
Institution:	anniversary of the innovation of the radio by	Alexander Stepanovich Popov.
Submitted:	•••••	
	•	
пинатансь вказанна		



IZYGEOV, H., Maj Gen. Eng-Tech. Service, hr. Tech. Sel., Professor.

"Ultrashort Radiowaves," from the book, M.dern Military Technology, 1956, page 145.

Translation 1114585

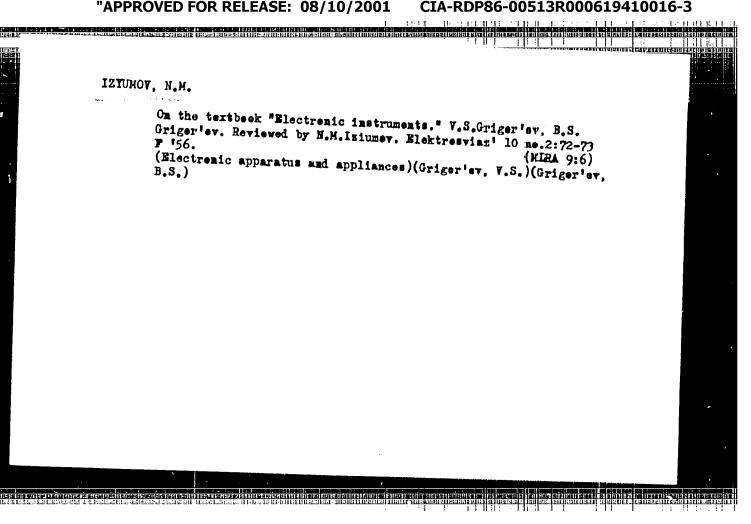
APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619410016-3"

On the road to "universal contacts." Tr. from the Russian. p. 3.

RADIO. Vol. 5, no. 7, 1956

Sofita, Eulgaria

SOURCS: East European Accessions List (EEAL) Library of Congress, Vol. 6, No. 1, January 1957



908

PHASE I BOOK EXPLOITATION

Izyumov, Nikolay Mikhaylovich

Kurs radiotekhniki (Course in Radio Engineering) 3rd ed., rev. and enl. Moscow, Voyen. izd-vo M-va obor. SSSR, 1958. 687 p. No. of copies printed not given.

Ed.: Vrublevskiy, A.V., Engineer-Lt. Col.; Tech. Ed.: Sribnis, N.V.

PURPOSE: The monograph is intended for students of vocational schools specializing in communications. It may also be used by the general reader with a secondary school education who has taken a general course in electrical engineering.

COVERAGE: General aspects of radio communication and radio equipment are presented. The book discusses the fundamentals of radiation and propagation of radio waves, oscillatory circuits and feeders, vacuum and semiconducting devices, and transmitting and receiving devices. Principles of radio relay communication and simple methods of checking transmitters and receivers are also described. No personalities are mentioned. There are 32 Soviet references.

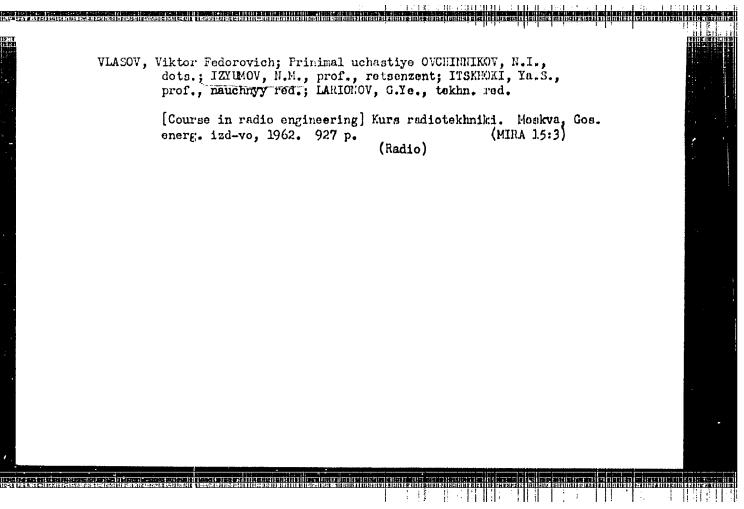
Card 1/13

IZTUNOV, Nikolay Mikheylovich; TARASOV, F.I., red.; BORUNOV, N.I.,
tekhn. red.

[Radio relay communications]Radioreleinmia svicz. Izd.2.,
polnost'iu peror. Moskva, Gosenergoizdat, 1962. 94 p.
(Massovain rediobiblioteka, no.447) (MIRA 15:12)
(Radio relay systems)

(Microwave communication systems)

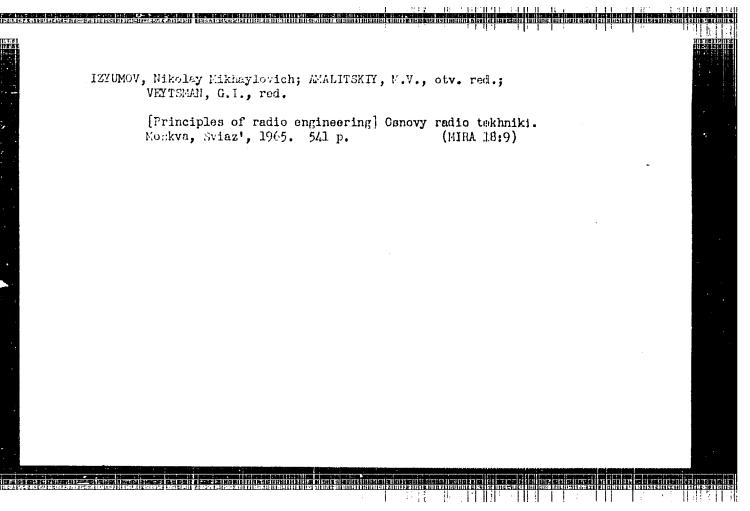
(Microwave communication systems)



L 2967-66 EWT(d)/EWP(k)/EWP(1)JKT UR/01.05/64/000/009/0093/0094 ACCESSION NR: AP5026357 AUTHOR: Baluyev, V. K.; Grudinskiy, P. G.; Izyumov, N. 14; Kulehakin, Y. 5.; Mirolyubov, N. N.; Sotskov, B. S.; Tsirlin, A. D.; Alekseyev, A. Ye.; Bogoroditskiy, N. P.; Berger, A. Ya.; Yayorskiy, V. N.; Musledov, D. M.; Vasil'yev, D. V. TITLE: | Nikolay Nikolayevich Lutsenko (Obituary) SOURCE: Elektrichestvo, no. 9, 1964, 93-94 TOPIC TAGS: electric engineering personnel ABSTRACT: Doctor of Technical Sciences, Major General in the Ruchnical Engineering Service, Professor N. N. Lutsenko died in May of this year after a long and serious illness. He graduated from the Moscow Higher Technical Academy in 1914 and was closely associated with his specialty of electrical engineering till the end of his life. He spent the first years of his practical activity at the Academy working in the electrical engineering laboratory of K. A. Krug. After that he begam his career in the Soviet Army as a lowly laboratory assistant in the radiotechnical laboratory and worked his way up over thirty years to be head of the Card 1/2

APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619410016-3"

L 2967-66 ACCESSION NR: AP5026357 Department of Electrical and Military Engineering. He wrote several books: "Alternating Carrents," "The Theory of Alternating Currents," "Course in General Electrical Engineering," "Radio Engineering" and, topsther with his co-workers, problem books on "A Course in Alternating Currents" and "The Physical Principles of Electrical Engineering." He set up a mumber of special courses (military application of electric power, military portable electric power stations, electric equipment for armies, electrification of military engineering works, etc.) and also participated in many engineering projects with the Soviet Army. He has written many texthooks, monographs and articles on the theoretical and applied divisions of military electrical engineering. These include "Electric Circuits" and "Fundamentals for the Design and Planning of Mobile Electric Stations," Makey of N. K. Lutsenko's students are working in sections of the Soviet Army, in scientific institutes and in colleges, and in industry. These students save continuing the work of their teacher, the founder of Soviet military electrical engineering. He received his professorahip in 1938 and his doctorate in 1949. He has received the Order of Lenin ! three "Red Banners," the Order of the ! Hod Star" and many modals. Orig. art. has: 1 figure. ASSOCIATION: none HUB CODE: EE ENCL: 00 SUBMITTED: 00 JPRS OTHER: NO REF SOV: OCO Card 2/2 (Lich



VERTSMAN, G.Z., kand. tekhn. nauk; PANTELLYEV, P.I., kand.
tekhn. nauk; GOMOLYAKO, I.M.; TAL', K.K.; GUSEVA, K.G.;
LUGOVOY, P.A.; MASSAN, A.M.; GALKIN, N.V.; SAFKEGINA, G.M.;
CHESNOKOV, D.S.; DROZDKOV, V.I.; IZYUMOV, P.S.; ZAK, B.O.;
KOROGID, P.Ye.; MAKSIMOVICH, L.N.; ZHOROVSKAYA, M.I.;
PAVLOVSKAYA, S.A.; BORISOV, A.V.; SELIVAHETS, N.Ye.; ITKES,
V.M.; YATSKEVICH, Ya.D.; KOZYRSKIY, N.P.; NIKITIK, V.D.;
NEKLEPAYEVA, Z.A., inzh., red.; MEDVEDEVA, M.A., tekhn.red.

[Design and planning of reilroad stations and junctions] Proektirovanie zheleznodorozhnykh stantsii i uzlov; spravochnoe i metodicheskoe proizvodstvo. Moskva, Transzheldorizdat, 1963. 443 p. (MIRA 16:12)

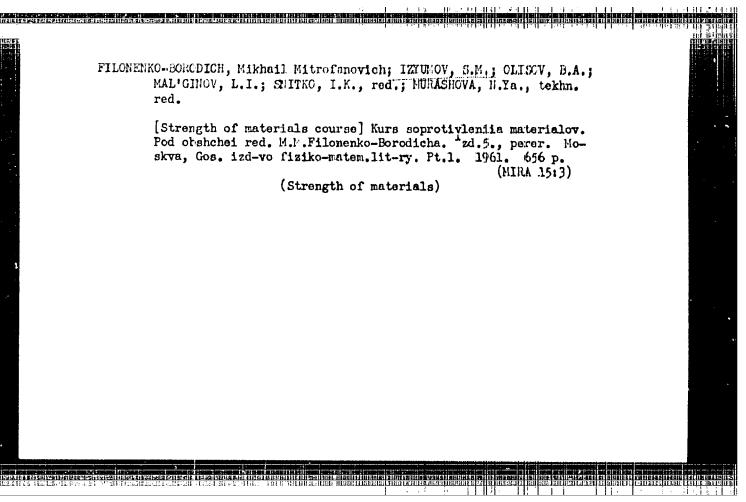
1. Nauchno-issledovatel'skiy institut transportnogo stroitel'stva (for Guseva). 2. Gosudarstvennyy institut tekhnikoekonomicheskikh izyskaniy i proyektirovaniya zheleznodorozhnogo transporta (for Zak). 3. Kiyevskiy gosudarstvennyy proyektno-izyskatel'skiy institut (for Kozyrskiy). 4. Moskovskiy
institut inzhenerov zheleznodorozhnogo transporta Im. I.V.
Stalina (for Nikitin).

(Hailroad engineering)

FILONENKO-BORCDICH, Mikhail Mitrofenovich; IZYUMOY. S.M.; CLISOV, B.A.;
KURTAVTSEV, I.M.; MALPOINOV, L.I.; SNITTO, I.X., redektor;
GAVRILAV, S.S., tekhnicheskiy redaktor

[A course in strength of materials] Kurs soprotivlenia materialov.
Pod obahchei red. M.M.Piloneko-Borodich. Izd. 4-03, perer. Moskva.
Gos. izd-vo tekhniko-teoret. lit-ry, Pt.2. 1956. 539 p. (MINA 1012)

(Strength of materials)



IZYUMOV, S.P. ekonomist

Irtysh-Karaganda Canal and bringing virgin lands of its zone under cultivation. Cidr,i mel. 14, no.3:9-15 Mr *62. (MIKA 15.4)

1. Vesesoyuznyy gosudarstvennyy proyektno-dzyskatel*skiy i nauchno-issledovatel*skiy institut Ministorstva sel*skogo khozyaystva SSSR (Irtysh Valley. Agriculture) (Karagan la Valley. Agriculture)

24(3)
AUTHORS: Skrotskiy, G. V., Nyryanov, F. S., Izyumov, T. G.

TITLE: The Influence of Paramagnetic Electron Remonance on the Optical Effect of Faraday at Low Temperatures (Vliyaniye elektronnogo paramagnitnogo rezonansa na opticheskiy effekt

Faraleya pri nizkikh temperaturakh)

PERIODICAL: Zhurnal eksperimental noy i teoreticheskoy fiziki, 1958,

Vol 35, Nr 6, pp 1471-1474 (USSR)

ABSTRACT: Daniels and Wesemeyer (Daniyels, Vezemeyer) (Ref 1) experimen-

tally investigated the influence exercised by magnetic

resonance on the optical Faraday (Faradey) effect. They worked with neodymium ethylene sulfate single crystals at 1.5 K, 9060 megacycles, and 5461 Å. Kastler (Ref 2) was the first to investigate the connection between Faraday effect and paramagnetic resonance, and Opechowski (Opekhovskiy) (Ref 3) carried out the respective quantum-mechanical calculations. The results obtained are discussed in the introduction. The authors of the present paper investigated these phenomena on the basis of the usual macroscopical theory; an explicit expression is derived for the angle of rotation of the polariza-

Card 1/3 tion plane of a light wave near paramagnetic resonance in a

 $$\rm SOV/56\text{--}35\text{--}6\text{--}22/44$$ The Influence of Paramagnetic Electron Resonance on the Optical Effect of Faraday at Low Temperatures

2 of which are Soviet.

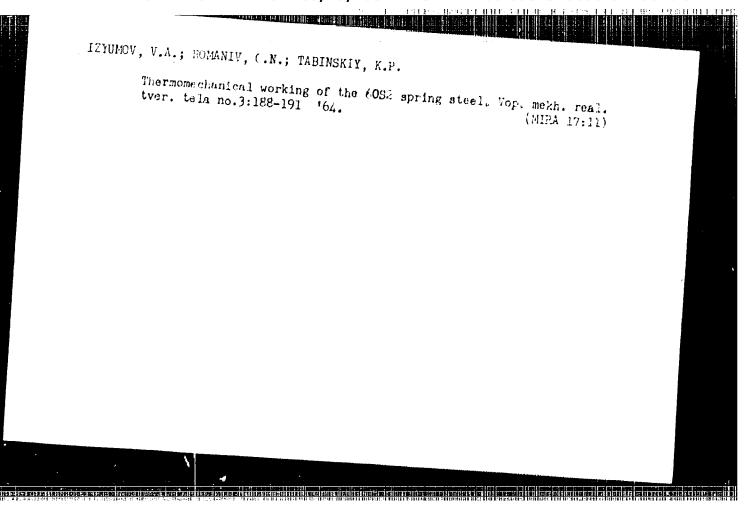
ASSOCIATION: Ural'skiy politekhnicheskiy institut

(Ural Polytechnic Institute)

SUBMITTED: June 19, 1958

Card 3/3

IZYUMOV, V. A.		
URSER/Metals Metallography Polarography	19k7	
Izyumov, 22 pp	in Polarized Light," V. A.	
a standard manhin	method of studying metals	
with aid of polarized by widely used in Soviet many	light. Old method but not metallurgical techniques. To this method editors publish in use of a polarized light	
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1.0		



RELEN'KIY, Ye.F. [deceased]; RISKIN, I.V.; YUKHNOVEKIY, C.L., prof., reteonzont; RATNIKOVA, K.I., dotsent, reteensent; GCL*IBERG, K.M., kend.tekhn.neuk, retsenzent; IEYUMOY, F.M., inzh., retsenzent; AYENBERG, Ye.S., red.; FOMKINA, T.M., tekhn.red.

[Chemistry and technology of pigments] Khimila i tekhnologiia pigmentov, Izd.3., ispr. i dop. Leningrad, Com., nauchno-tekhn. (MIKA 14:4)

1. Zaveduyushchiy kafedroy lakov i krasok Khar*kovnkodo politekhnichsekogo instituta (for Yukhnovskiy). 2. Kafedra lakov i krasok Khar*kovskogo politekhnichsekogo instituta (for Hatnikova).

(Figments)

CEST COLLECTION FOR HUMBER STREET THE COLUMN TO THE COLUMN

8/081/61/000/021/084/094 B145/B144

AUTHOR:

Izyumov, V. N.

TITLE:

Use of p-tert-butyl bensoic acid for the synthesis of resins

for paints and varnishes

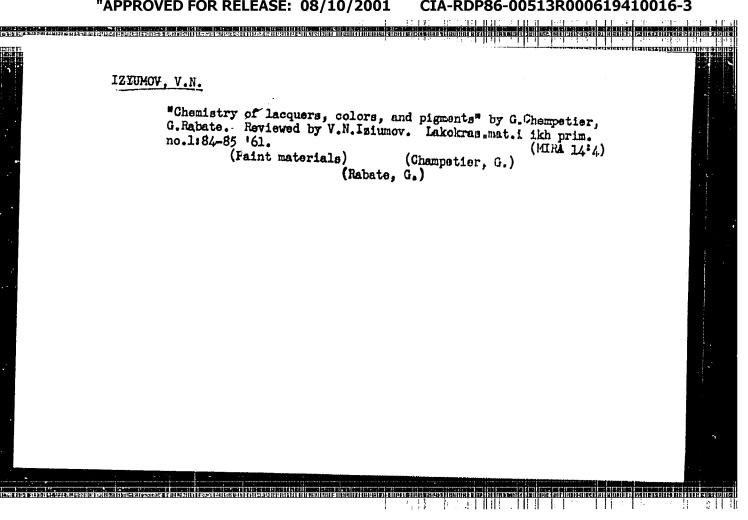
PERIODICAL:

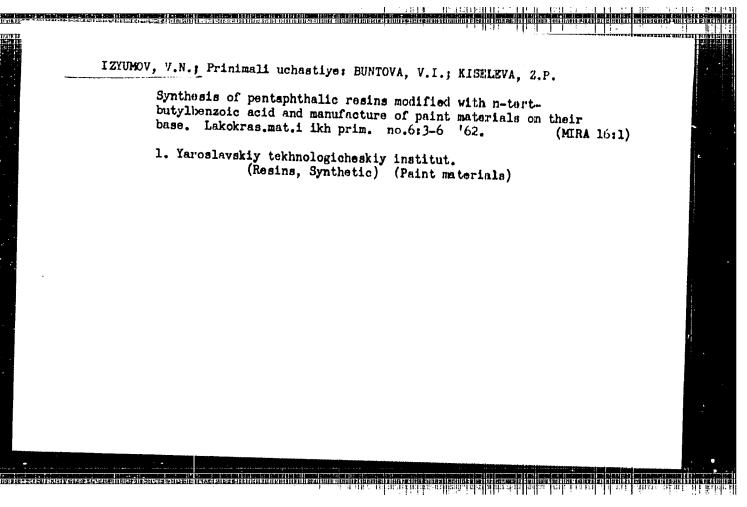
Referativnyy shurnal. Khimiya, no. 21, 1961, 456, abstract 21P112. (Lakokrasochn. materialy i ikh primeneniye, no. 1, 1961, 3 - 8

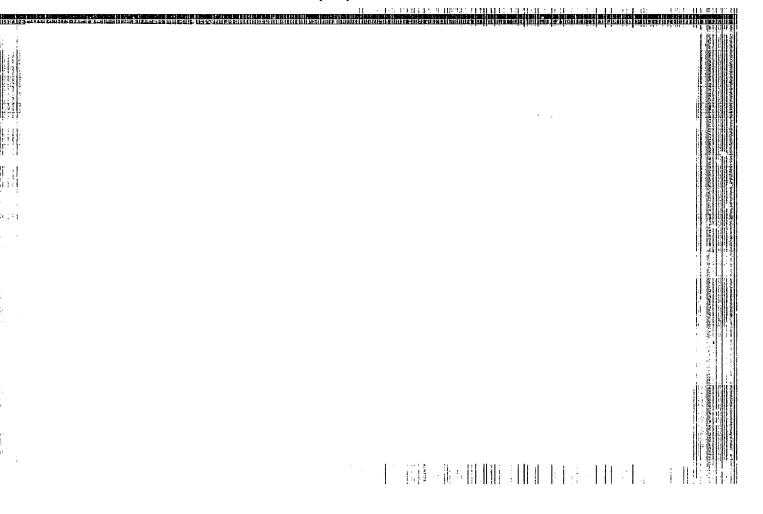
TEXT: The glycerol and pentaerythritol esters of butyl bennoic acid (I), as well as the glyptal resins (II) and pentaphthalic remins (III), modified with I, were synthesized and their usability for producing various varnish and paint materials examined. It has been found that, owing to the relatively simple synthesis of I, the latter must be counted among the most economic and inexpensive raw materials for varnishes and paints. It is noted that the pentaerythritol esters of I improve the gloss, hardness, and water resistance of nitrolacquer coatings substantially. XI and IXI

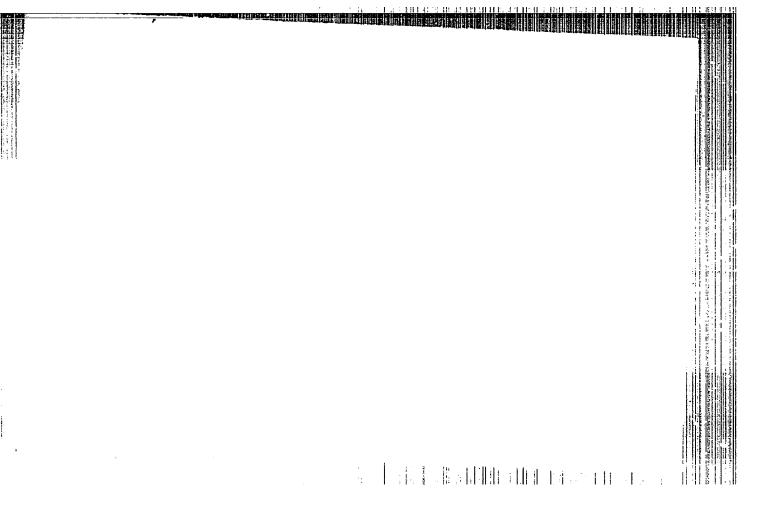
free from oil and modified by I are economic and high-quality solid resine

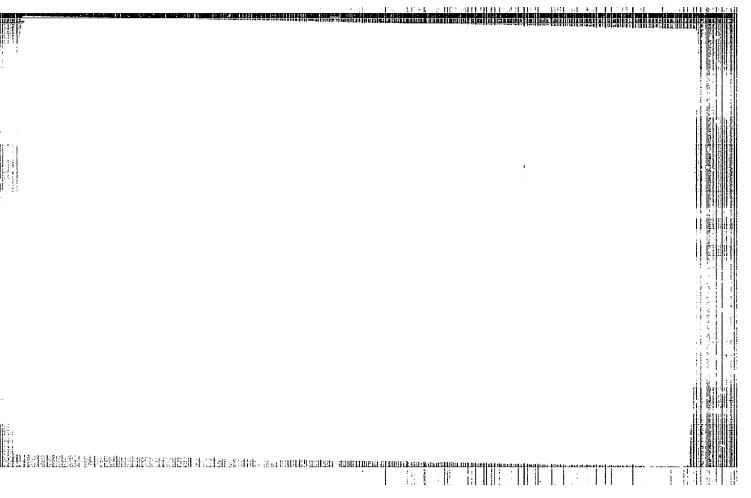
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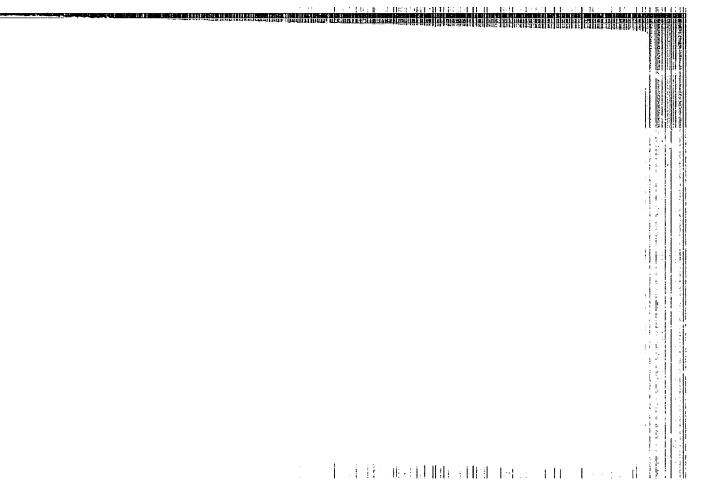


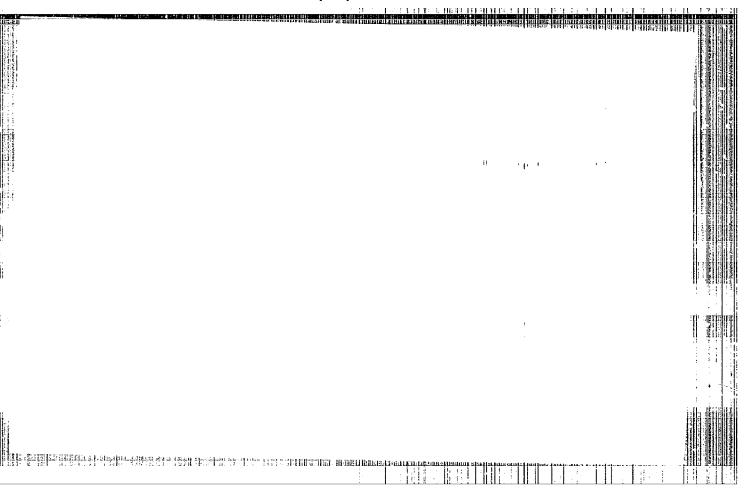


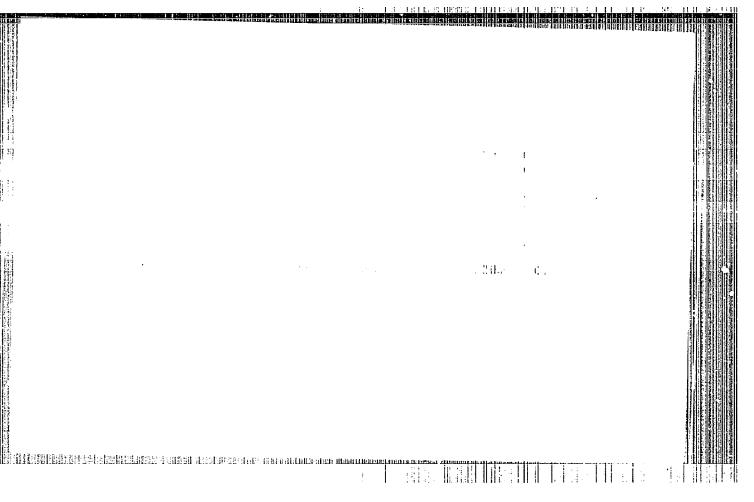


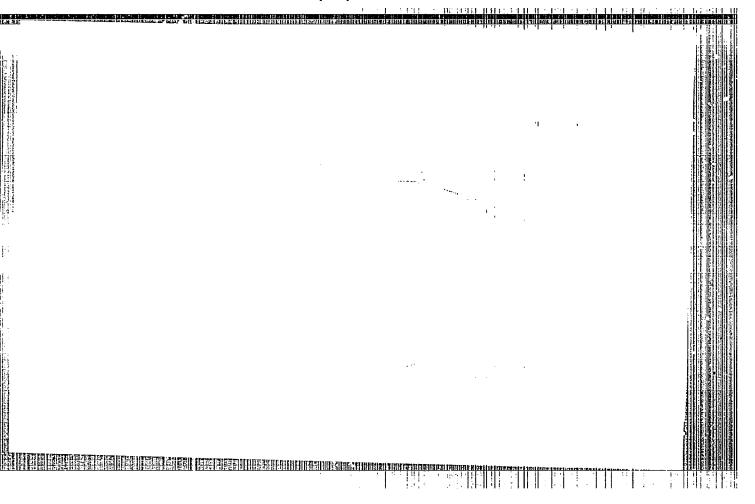












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	A 1116-1 AF 6 AFBC 305 S700537537180 (101, 110+170034 AUTHOR: Izyumov, Ya. A.	
5/9	TITLE: Theory of scattering of slow neutrons in ragnetic crystals SCURCE: Uspekhi fizicheskikh nawk, v. 80, no. 1, 1963, 41-92	
	TOPIC TAGS: slow neutron scattering, magnetic crystal, phonon, magnon, emission, absorption, neutron polarization	47-1
	ABSTRACT: The theory of scattering of slow neutrons in crystalls is presented systematically, with principal attention focused or magnetic scattering, particularly on questions which have become important in recent years, such as inclastic scattering, ing, critical scattering, and the scattering of polarized neutrons. The presentation is within a unified mathematical reatment corresponding to a description of the scattering in the Born approximation. By introducing the so-called time fixed alism, first used by Van Hove (Phys. Rev. v. 95, 249 and 1374, 1954), the problem of calculating the scattering cross section per unit solid angle and per unit emergy interval is reduced to a computation of the Fourier components of the correlations between the positions of two atoms in the lattice at different instants of time, and	
	Card 1/2	

44541-05

ACCESSION NR: AP3002506

to a calculation of the correlation functions of the spin projections, for the number lear and ragnetic scattering, respectively. The appropriate mathematical apparetus is first developed and applied to an analysis of the interaction between also neutrons and a magnet and to the determination of the differential cross section for scattering of unpolarized neutrons. This is followed by consideration of elastic nuclear and magnetic scattering of neutrons in single- and polycrystals and an exposition of the fundamentals of nuclear and magnetic neutronography. Inelastic scattering of neutrons is then considered, with the discussion limited to one-quartum scattering in which one phonon or one magnon is absorbed or emitted. This is followed by study of magnetic scattering of neutrons near the Capim or Menl point, also one with critical scattering of neutrons, which arises under second-order phase transformation conditions. The review concludes with a treatment of the scattering of polarized neutrons and an analysis of the scattering cross sections of the polarized neutrons and the change in the incident-neutron polarization vector due to scattering in ferromagnets and antiferromagnets. Orig. ant. has 6 figs. and 199 formulas.

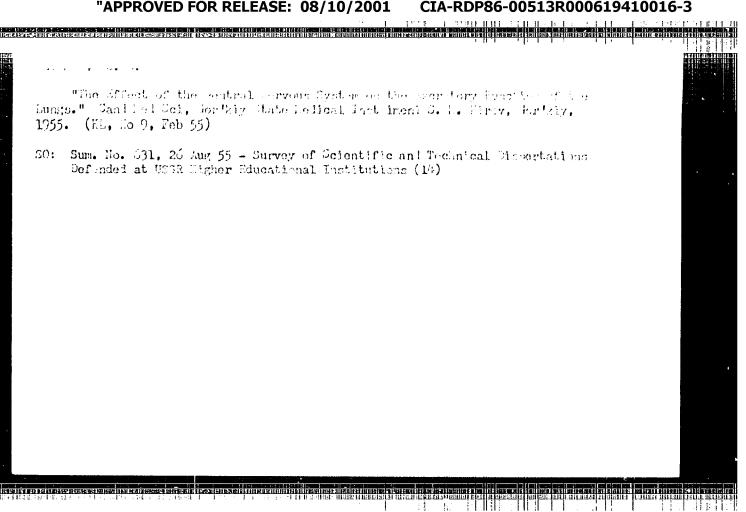
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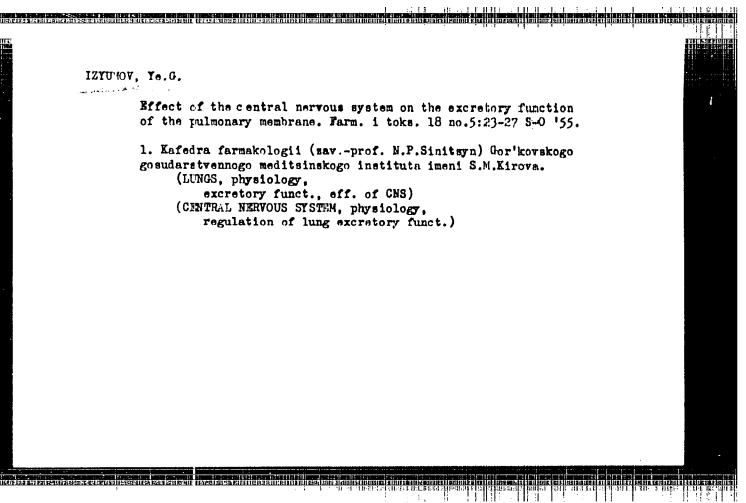
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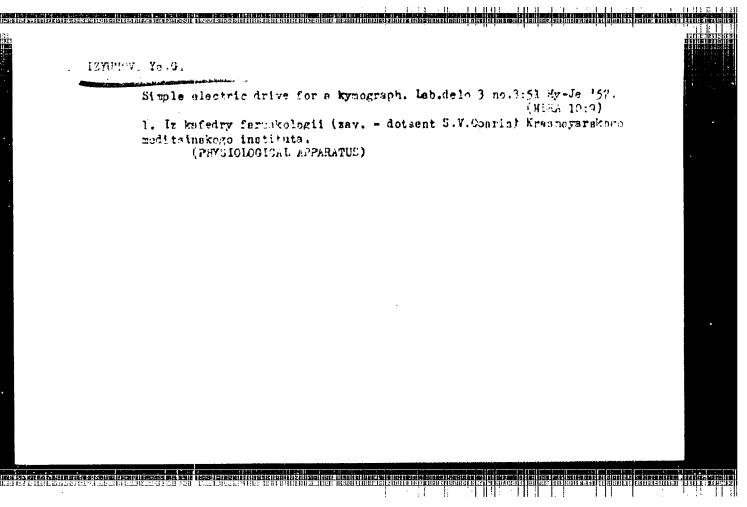
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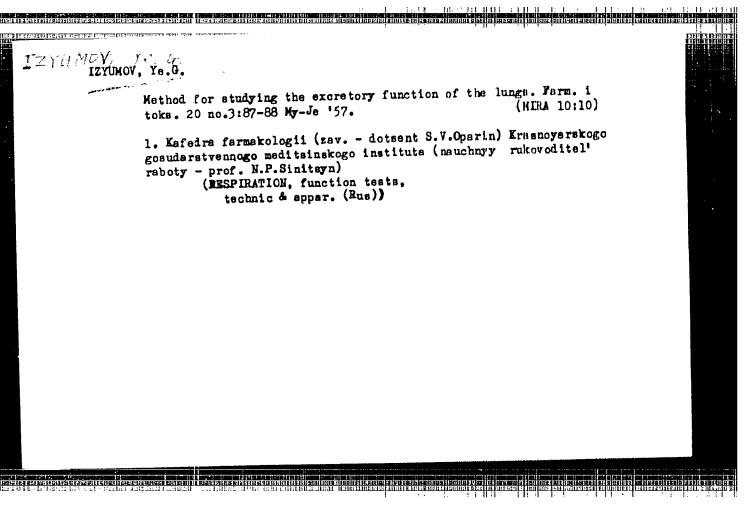
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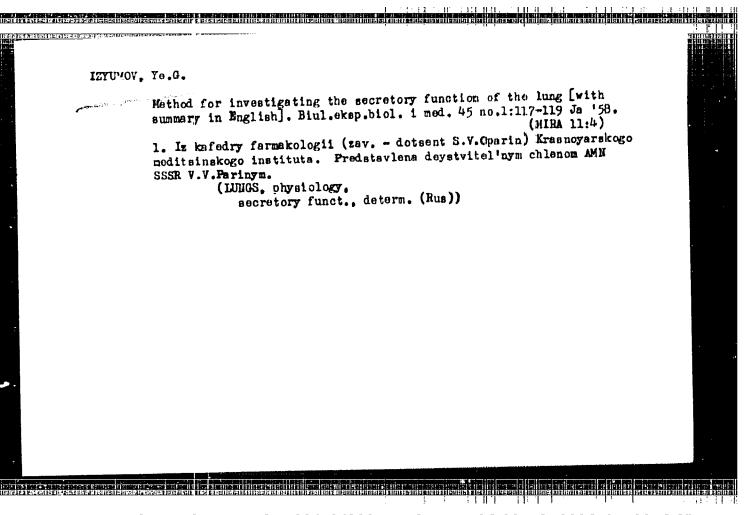
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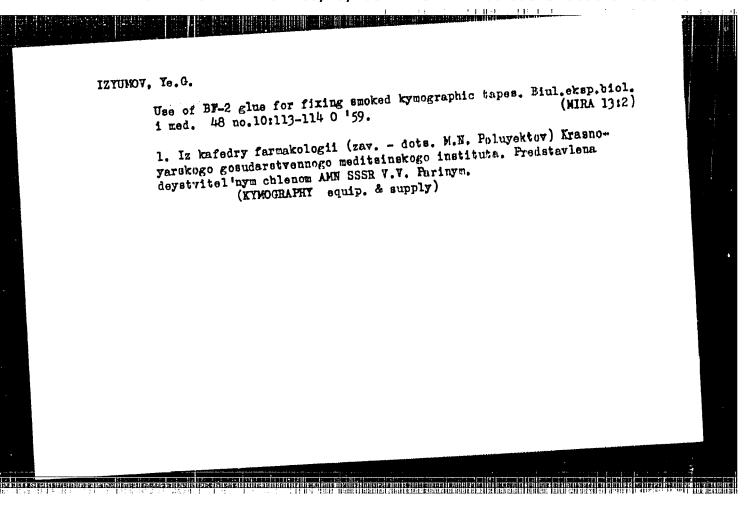












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CIA-RDP86-00513R000619410016-3

L 17696-66

ACC NR: AP5024177

SOURCE CODE: UR/0290/65/000/002/0126/0129

AUTHOR: Lapik, A. S.; Izyumov, Ye. G.

ORG: Novosibirsk Institute of Organic Chemistry, Siberian Department AN SSSR (Novosibirskiy institut organicheskoy khimii Sibirskogo otde laniya AN SSSR)

TITLE: Pharmacological properties of the individual glycocides of Sirenia siliculosa

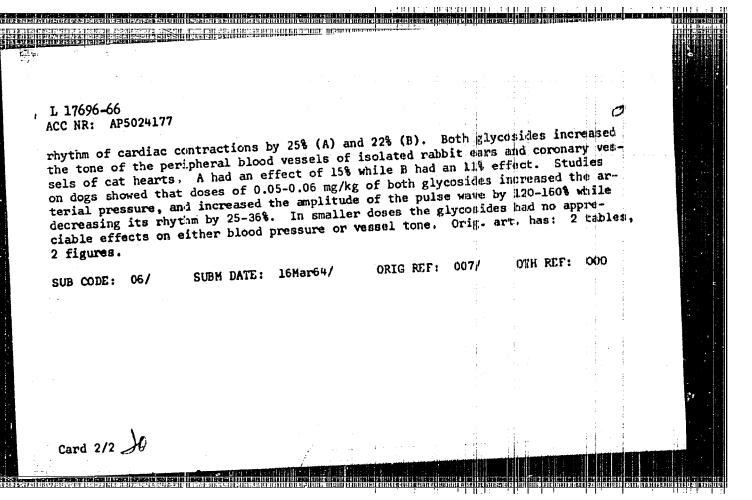
SOURCE: AN SSSR. Sibirskoye otdeleniye. Izvestiya. Seriya biologo-meditsinskikh nauk, no. 2, 1965, 126-129

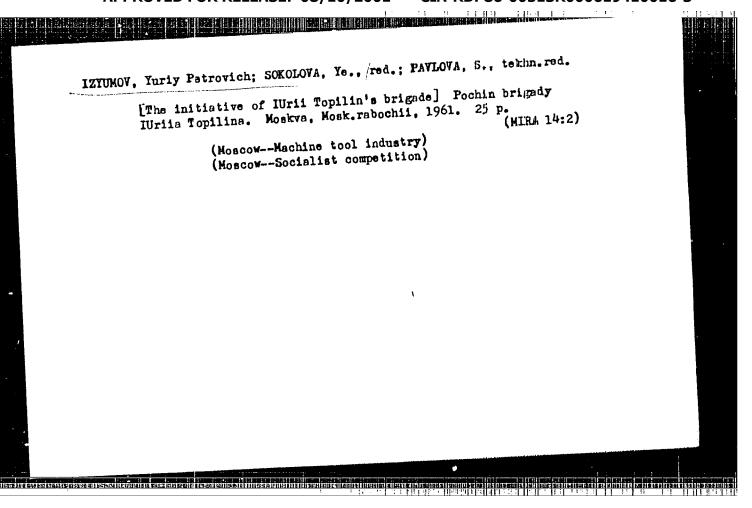
TOPIC TAGS: cardiovascular system, pharmacognosy, pharmacology, drug effect, pharmaceutic, alkaloid

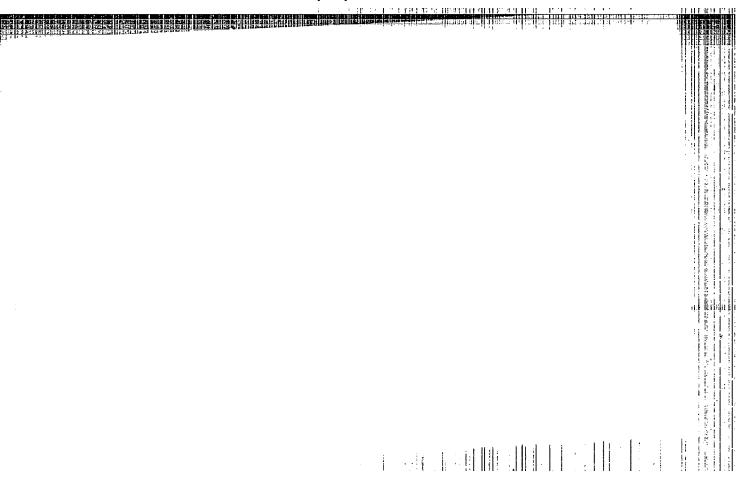
ABSTRACT: The pharmacological effect of two glycosides (A and B)—derived from a crude preparation of Sirenia siliculosa—on the cardio-vascular system is investigated. Experiments on cats showed that A is more toxic than B and that both lack cumulative effects. Intravenous injections of 0.05 mg/kg increased the intensity of cardiac contraction by 65% with A and 58% with B and simultaneously slowed the

UDC: 615.32+615.711

Card 1/2







Berdyshev, A. A. and Izyumov, Yu. A. 126-5-3-24/31 AUTHORS: The/Exchange Model for Transition Metals (K s-d-TITLE: obmennoy modeli perekhodnykh metallov) PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol 5, Nr 3, pp 552-3 (USSR) ABSTRACT: In the s-d model the atom is assumed to have several (z) d-electrons, of which the energy operator is the first equation in the paper. The spontaneous magnetization M is related to M_d, defined by Eq.(1), where b and c are constants defined in Ref.(4) (and not in the paper). If α is large, M varies exponentially with T (s-d exchange). If $\alpha \ll 1$ the exact form of the law will depend on the value assigned to b, which may be 10^{-14} lb erg. The Euler-Maclaurin summation is then applied to give M_d in series form; the extra linear term this introduces then gives somewhat better agreement with experiment Card 1/1 than a simple T3/2 law. The paper contains 5 equations, (only one numbered). There are 10 references, 7 of which are Soviet, 3 English. ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo)

(Ural State University imeni A.M. Gor'kiy)

SUBMITTED: April 11, 1957 2. Mathematics 1. Metals--Electron transitions

56 -5 -15/55

The Generalization of the Model of the Spin laves For the Case Where Each Node is Surrounded by Several stectrons.

to the s-basic state in the isolated atom, also with the states of strong degeneration. The wave function of these states be of strong degeneration. The wave function of these states be of (qrs) with v running through a finite totality of values. The interatomic distances be so great that the possibility of superposition of the electron orbits remains small. The Hamiltonian of such a system is written in the representation of the second quantization. Canonic transformations are applied to certain Fermi operators. The thus obtained operators approximations for the seal of the weak excita-

tely satisfy the Bose interchange relations, if the weak excitations of the system are investigated. By diagonalization an expression for the energy of the system investigated in the paper under review is obtained.

Then the present paper presupposes at each node several electrons. In a ferromagnetic, of the branches of the antiferromagnetic only one depends quadratically on the quasi-impulse. In an antiferromagnetic there exist, at a electrons per atom, 2s mutually independent branches of Bose excitations (in a ferromagnetic they

are 2). Finally the paper under review deals with the following auxiliary problem: The energy of a weakly excited state of a

CARD 2/3

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sov/56-35-5-13/56 24(3) Izyumov, Yu. A.

AUTHOR: On the Interaction of the External and Internal Blectrons in TITLE:

Ferromagnetic Transition Metals (O vzaimodeystvii vneshnikh i vnutrennikh elektronov v ferromagnitnykh perakhodnykh

metallakh)

Zhurnal eksperimental noy i teoreticheskoy fiziki, 1958, PERIODICAL:

Vol 35, Nr 5, pp 1148-1154 (USSR)

Already Vonsovskiy and Turov (Refs 1, 2) investigated the inter-ABSTRACT:

action between 4s- and 3d-electrons on the assumption that in transition metals these 4s-valence electrons together with the electrons of the not filled 3d-shell play the active part, for the strong exchange interaction between the latter leads to the complete directioning of 3d-electron spins, i.e. to ferromagnetism. The spectrum of such an electron system is of mixed character, containing Bose (Boze) and Fermi branches. For the purpose of investigating interaction between 3sand 4d-electrons in transition metals, the author bases upon

a Mamiltonian for a weakly excited state of the electron system, which was set up according to Vonsovskiy and Turov (Ref 2).

It is shown that the dynamic part of interaction consists in Card 1/2

sov/126-7-4-3/26 Izyumov, Yu.A. AUTHOR: The Spectrum of Elementary Excitations of the Electron System of a Monoatomic Nonconducting Crystal. TITLE: I. Z-Electrons Per Atom PERIODICAL: Fizika metallov i metallovedeniye, 1959, Vol 7, Nr 4, pp 495-503 (USSR) In the many-electron theory of solids one usually starts with models in which it is assumed that at each lattice ABSTRACT: point there is only one electron which takes part in the given processes inside the crystal. This is only a very approximate approach which is designed to reduce the mathematical difficulties. However, there exist types of solids which cannot be described by such simplified models, for example, semiconductors with closed electron shells and transition metals. In order to explain the electrical and magnetic properties of such substances, it is necessary to consider two groups of electrons. Recently, attempts have been made to discuss the case of a few electrons per atom on the many-electron scheme. Among these attempts are the papers by the present author (Ref 2) and by Kondorskiy

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SOV/120-7-4-3/26

The Spectrum of Elementary Excitations of the Electron System of a Monoatomic Nonconducting Crystal. I. Z-Electrons Per Atom

representation is given by Eq (4), (5) and (6). The Bose character of the spectrum is connected with the fact that the number of electrons per atom is constant during the excitation process. The elementary excitations associated with changes and conservation of the spin projection are independent. The author wishes to thank S.V.Vonsovskiy, A.A.Berdyshev and Ye.A.Turov for discussing the results of this work. There are 5 Soviet references.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo (Ural State University imeni A.M.Gor'kiy)

SUBMITTED: March 4, 1958

Card 3/3

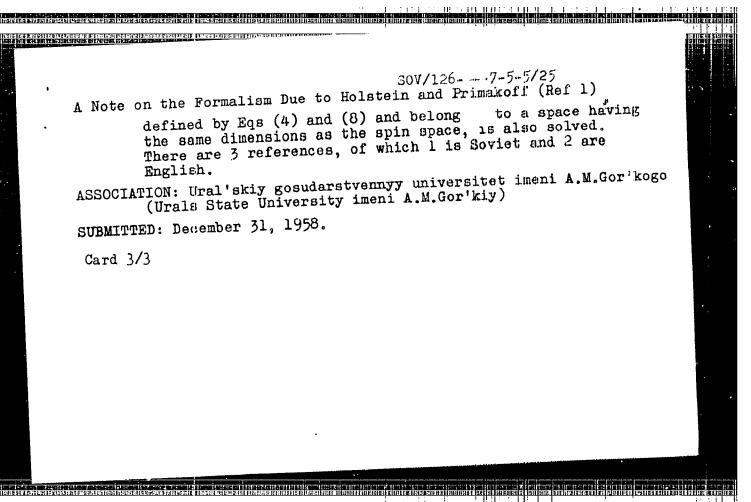
sov/126---7-5-5/25

A Note on the Formalism Due to Holstein and Primakoff (I) relations (1) for the operators bj and b⁺, are approximately Bose relations. On the basis of the correspondence principle, it is assumed that the deviation of these operators from Bose operators may be described by a function of the number of particles

 $n = b_{j}^{+} b_{j}$.

Using Eqs (2) and (3), Eq (4) can be obtained, where $f_8(n)$ and $Z_s(n)$ are functions subject to condition (5). These functions are given by Eq (8). The converse problem, namely, the problem of finding operators b_{sj} and b_{sj}^+ which are Card 2/3

CIA-RDP86-00513R000619410016-3" APPROVED FOR RELEASE: 08/10/2001



sov/126-8-1-1/25

The Spectrum of Elementary Excitations of the Electron System of a Monoatomic Nonconducting Crystal. II. On the Limits of Applicability of the Dirac Exchange Hamiltonian

electrons forming an open shell of an atom is z and a weak Russell-Saunders coupling exists between these electrons so that the atom as a whole can be assigned a spin number s. The orbital states of these electrons are indicated by the subscript \,\lambda. for a system of electrons in a metal on the second quantization representation can be written down in the form of Eq (2) (Ref 2). If one neglects transitions between different orbital states and assumes the conditions given by Eq (3) hold, then the Hamiltonian given by Eq (2) is simplified to the form given by Eq (4), is the exchange $I(f_1\lambda_1f_2\lambda_2) = F(f_1\lambda_1f_2\lambda_2f_2\lambda_2 f_1\lambda_1)$ integral between two electron states. Since orbital transitions are forbidden, the only dynamic variables of the system are the spin coordinates and hence it is clear that the Hamiltonian given by Eq (4) may be expressed in terms of spin operators. The Hamiltonian, Eq (4), can card 2/4 then be written down in the form given by Eq (5), where

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65885 SOV/126-8-1-1/25

The Spectrum of Elementary Excitations of the Electron System of a Monoatomic Nonconducting Crystal. II. On the Limits of Applicability of the Dirac Exchange Hamiltonian

of Eq (6) one then obtains Eq (10), where W constant and is given by Eq (11). In Eq (11) ſλ are classical spin vector operators. Eq (10) is identical with the Dirac Hamiltonian given by Eq (1) except for the constant term Wo. This shows at once the character of the approximate nature of Eq (1). The Hamiltonian given by Eq (1) can only be used when the open electron shell of an atom is sufficiently "compact" and, owing to internal exchange interactions, behaves as one. If the electron shell is "loose", then Eq (6) must be used or the more general Hamiltonian given by Eq (2). This analysis is used to study the effect of the character of the electron shell on spin waves. For simplicity a ferromagnetic in which all the z-electrons in an atom have the same spin directions is There are 5 references, 3 of which are considered. Soviet and 2 English.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo

(Urals State University imeni A. M. Gorkiy)

SUBMITTED: March 4, 1958

Card 4/4

SOV/126-8-2-25/26

Magnetic Anisotropy on the Basis of Spin-orbit Interaction

crystal can lead to anisotropy. Ye.A. Turov is thanked for valuable advice and S.V. Vonsovskiy for discussing the results.

There are 2 references, 1 of which is Soviet and 1 English.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni
A.M. Gor'kogo (Ural State University in. A.M. Gor'kiy)

SUBMITTED: November 11, 1958

Card 2/2

67656 50V/126-6-6-2/24

Dipole-Dipole Interaction in Ferromagnetic Resonance

resonance.
(Ref 2) and interaction dependence of thermal
with temperat vital and interaction leads to nonuniform.

fluctuations, he secular interaction leads to nonuniform local demagnetizing fields which cause the line broadening. At absolute zero this broadening disappears (complete ferromagnetic order). The fourth section is concerned with the effect of non-secular terms. It is concluded that dipole-dipole interaction plays an important part in ferromagnetic resonance and leads to a broadening which at 10°K, for example, is of the order of 100 cersted. However, to explain the large line width at absolute zero, other mechanism of interaction must be considered. In the case of ferrites, the interaction of spin waves with natural irregularities in the magnetic structure of the lattice is important (Ref 9) while in metallic ferromagnetics, conduction electrons contribute to this mechanism. Acknowledgment is made to Ye.A.Turov who mechanism. Acknowledgment to made to references, 9 of suggested this subject. There are 10 references, 9 of which are English and 1 German.

Card 2/3

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TO SEA TO THE COLUMN TO SEA THE RESIDENCE OF THE SEA T 504/20-125-6-14/61 24 (2) Izyumov, Yu. A. A Remark on the Formalism of Holstein and Primakoff AUTHOR: (Zamechaniye otnositel'no formalizma Gol'shteyna i Primakova) TITLE: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 6, PERIODICAL: pp 1227-1230 (USGR) It is a known fact that the energy spectrum of a magnetically ordered crystal may be approximated near the ground state by the spectrum of a weakly non-perfect Bose gas. From the ABSTRACT: mathematical point of view, this process is equivalent to the transition from spin- to Bose-operators. The author endeavors to find a connection between them in a general form, For this purpose, it is best to bese upon the following exchange relations for the spin-operators: $[S_j^i, S_k^+] = \delta_{jk} S_k^+;$ $[s_j^z, s_k^-] = -s_{jk} s_k^-; [s_j^+, s_k^-] = 2s_{jk} s_k^*, \text{ where } s_j^\pm = s_j^k \pm i s_j^y$. In quasiclassical approximation - for large spins (s >> 1) and small deviations from the ground state (as quantization axis the z-axis is selected) it is easy to show that Card 1/5

SOV/20-125-6-14/61 A Remark on the Formalism of Holstein and Primakoff b_{sj} and b_{sj}^{+} as are defined by the above written down relations and act in a space of the same dimension number, i.e. 2s + 1 as also the spin operators. Between these operators the = $S_{ik}(1 + B_s(\hat{n}_j))$ are assumed to hold, where $B_s(\hat{n}_j)$ is an unknown function of the operator $\hat{n}_j \equiv b_{sj}^{\dagger} sj$. Here it further holds that $\lim_{s\to\infty} B_s(\hat{n}_j) = 0$. The exchange relations just written down are satisfied if b_{sj}^+ = b_{sj}^{2s+1} = 0 and $B_s(\hat{n}_j)$ = $a_s b_{sj}^+$ b_{sj}^- holds. The eigenvalues of the operator $\hat{n} = b_s^+$ are the integers 0, 1, 2, ..., 2s. The matrices $\{b_g\}$ and $\{b_g^{\dagger}\}$ (which give a linear representation of the operators b and b; respectively) satisfy all necessary relations and give a linear representation of the operators b_s and $b_{\bar{B}}^{\dagger}$. The total number card 3/5

CIA-RDP86-00513R000619410016-3" APPROVED FOR RELEASE: 08/10/2001

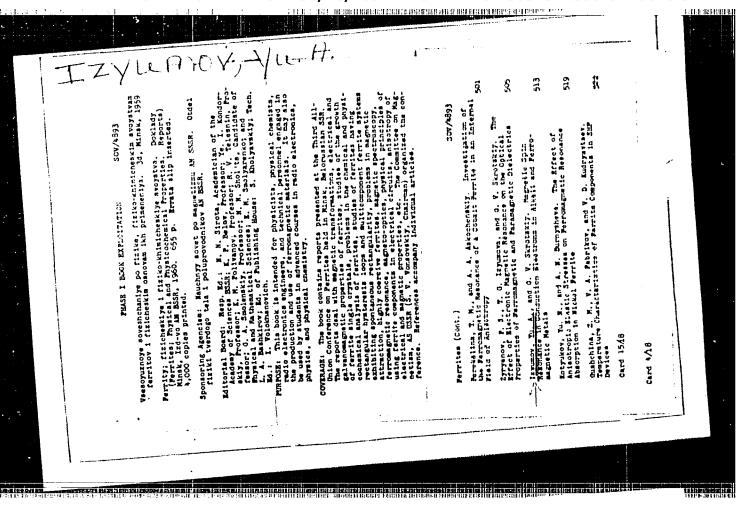
A Remark on the Formalism of Holstein and Primakoff SOV/20-125-6-14/61

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im. A. M. Gor'kogo (Ural State University imeni A. M. Gor'kiy)

PRESENTED: January 15, 1959, by N. N. Bogolyubov, Academician SUBMITTED: January 8, 1959

card 5/5

"APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619410016-3



Spin Resonance on Conduction Electrons in Ferromagnetic Metals

S/181/60/002/008/012/045 B006/B070

magnetic moment, the energy of the conduction electrons must depend on the orientation of the spin relative to the magnetization vector, and for the simplest case it may be assumed that the energy of an electron is a function of both the quantum numbers k and o (quasimomentum and spin). The form of the magnetic resonance absorption lines is calculated on the assumption that the effective mass of conduction electrons depends on the orientation of the spin relative to the spontaneous magnetic moment. The interaction of the electrons with one another and with the lattice is described by the operator lint, in terms another and with the lattice is described by the Hamiltonian quantization representation is represented by the Hamiltonian

X

 $\hat{\mathcal{X}} = \sum_{\vec{k}\sigma} \hat{a}_{\vec{k}\sigma}^{\dagger} \hat{a}_{\vec{k}\sigma}^{\dagger} + \hat{\mathcal{X}}_{int}$. If \hat{S}_{α} is the spin operator of the electron system, the operator of the magnetic moment may be put as $\hat{M}_{\alpha} = 2\mu_{0}S$ system, the operator of the magnetic moment may be put as $\hat{M}_{\alpha} = 2\mu_{0}S$ (μ_{0} -Bohr magneton). The \hat{S}_{i} (i = x, y, z) are given by formula (13), the Card 2/3

s/126/60/009/05/003/025 E032/E514

The Spectrum of Resonance Frequencies of a Ferromagnetic Metal

interaction, the exchange interaction is the most important. The present paper is concerned with the effect of the s-d-exchange interaction on the spectrum of natural frequencies of the magnetic moment in transition metals. In order to estimate the contribution due to the exchange interaction, the s-d-exchange model described by Vonsovskiy in Ref l is employed. Vonsovskiy and Turov (Ref 2) have shown that the Hamiltonian for a system of s + d-electrons in a constant magnetic field H directed along the z-axis can be written in the form of Eq (1), where S and S are the spin operators for the f-th site, S is the total spin of d-electrons, is the total spin of s-electrons ($\alpha = x,y,z$), $a_{k\sigma}^{+}$ and $a_{\mathbf{k}\sigma}$ are the Fermi creation and annihilation operators for the states of s-electrons on the Bloch scheme, $J(k_1k_2)$ is the s-d-exchange integral and g_d and

are the Lande factors for the d- and s-electrons. Card 2/5

CIA-RDP86-00513R000619410016-3" APPROVED FOR RELEASE: 08/10/2001

s/126/60/009/05/003/025 E032/E514

The Spectrum of Resonance Frequencies of a Ferromagnetic Metal

In accordance with the approximation described by Eq (6), the Hamiltonian given by Eq (1) can be rewritten in the form of Eq (10). The approximation thus turns out to be identical with the molecular field approximation. In order to determine the natural frequencies for the spin vector, Eqs (7) and (8) are linearized, assuming that the z-components of the spin vectors are constants, i.e.

 $s_d^z = \langle s_d^z \rangle$; $s_s^z = \langle s_s^z \rangle$.

This leads to the system of four equations given by Eq (11) in which ω_d and ω_s are the Larmor frequencies defined by Eq (12). Eq (11) leads to the two natural frequencies given by Eq (13) and in the special case when the g-factors of the s- and d-electrons are equal, Eq (13) simplifies to the simple form given by Eq (14). Thus, Card 4/5 during resonance in a transition ferromagnetic metal two

APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619410016-3"

s/126/60/009/05/004/025 E032/E514

Izyumov, Yu. A. and Yakovlev, Ye. N.

Ferromagneti On the Theory of the Heisenberg Model of a AUTHORS: TITLE:

with a Few Electrons Per Site

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, No 5, pp 667-672 (USSR)

ABSTRACT: In many cases the properties of ferromagnetics can be satisfactorily described by the simple Heisenberg model in which it is assumed that each lattice site can be characterized by the resultant spin s and that at absolute zero the spins are completely ordered. The Hamiltonian of such a system placed in a magnetic field H is usually written in the form given by Eq (1), where S_f is the spin operator for the site f and $J(f-f^1)$ is At the present time only the lower eigenvalues of the operator given by Eq (1) are the exchange integral. well known. These eigenvalues correspond to weakly excited states of the ferromagnetic which appear at low

Card 1/6 temperatures. It is very difficult to find a method for

APPROVED FOR RELEASE: 08/10/2001 CIA-RDP86-00513R000619410016-3"

S/126/60/009/05/004/025 E032/E514

On the Theory of the Heisenberg Model of a Ferromagnetic with a Few Electrons Per Site

The b_f and b_f^{\dagger} operators are not Bose operators and obey the further relations given by Eq (4), where n is the occupation index. The retarded and advanced Green functions employed in the present generalization of the Bogolyubov-Tyablikov theory are defined by Eq (5), where bg(t) is the bg operator on the Heisenberg representation, the square brackets indicate the commutator and the \(\) denotes an average over a statistical ensemble with a Hamiltonian H, i.e.

$$\langle \cdots \rangle = \operatorname{Sp} \left\{ e^{-\beta H} \cdots \right\} / \operatorname{Sp} e^{-\beta H}; \quad \beta = 1/kT$$

It is easy to show that the Green functions defined in this way obey the differential equation given by Eq (6), where h is the Planck constant divided by 21 and $\delta(t-t')$ is the Dirac δ -function. If the quantity

Card 3/6

\$/126/60/009/05/004/025 E032/E514

On the Theory of the Heisenberg Model of a Ferromagnetic with a Few Electrons Per Site

contains, in addition to spin waves, high energy Bose branches which are the analogues of optical vibrations in solids when it is assumed that the elementary cell consists of a number of atoms. The presence of such branches in the energy spectrum of a real ferromagnetic. in which there are a number of "magnetic" electrons per atom, should be manifested in magnetic resonance absorption corresponding to transitions between energy levels with k = 0. In such cases an additional maximum should be observed at a frequency given by Eq (27), which in general lies in the infrared region. However, near the Curie point when σ is very small (σ is the relative magnetization; Eq (15)) this frequency may lie in the radio range. This situation is equivalent to the case of ferrites with a number of sub-lattices for which an analogous additional maximum has been observed. Acknowledgments are made to Card 5/6 Corresponding Member of the Academy of Sciences, USSR

9.4300 (3203,1043,1143)
24.7900 (1035,1144,1160)

S/126/60/010/001/026/027/XX E032/E314

AUTHOR: LZyumov, Yu. A.

Firect of linegularities in the Magnetic Structure, on the Width of the Ferromagnetic Resonance Line TITLE

Fizika metallov i metallovedeniye, 1960, PERIODICAL: Vol. 10, No. 1, pp. 140 - 142

Clogston et al (Ref. 1) have discussed the scattering of spin waves on natural irregularities in the magnetic structure assuming that this is the mechanism responsible for the observed increase in the ferromagnetic resonance line width in some ferrites. The obtained formula for the line width is in agreement with experiment insofar as the temperature dependence is concerned, although the width itself was found to be somewhat lower than the experimental value, The present author accepts this mechanism but approaches the problem from the following point of view. Consider a ferromagnetic crystal placed in a constant magnetic field H which is directed along the z-axis, and an alternating magnetic field of frequency $\omega_{\rm sp}$ which is polarised in a perpendicular Card 1/5

872L3 5/126/60/010/001/026/027/XX E032/E314

Effect of Irregularities in the Magnetic Structure on the Width of the Ferromagnetic Resonance Line is the same operator in the of the specimen and $M_{X}(t)$ Heisenberg representation. The Hamiltonian is then separated into two parts, namely H_0 and H_1 where H_0 is the sum of the exchange operator of the system of spins and their energy in the constant magnetic field and H' is a dipole-dipole interaction energy. A perturbation calculation is then performed and it is shown that the half-width is given by

$$\Delta_{1/2}^{\omega} = 0.01 \frac{\langle \Delta D_{jk}^2 \rangle}{hJ} \text{ szu}$$
 (11)

whereas Kubo and Tomita (Ref. 1) have found that

 $\Delta_{1/2}^{\omega} \sim \sqrt{\mu}$. If it is assumed that fluctuations in the Card 3/5

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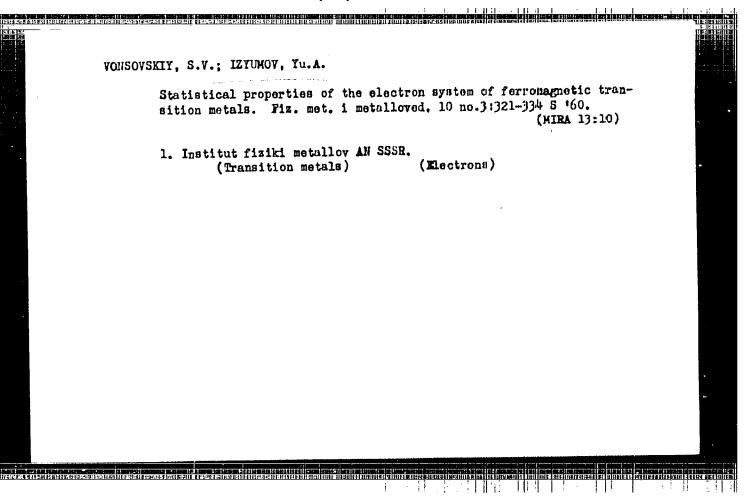
Effect of Irregularities in the Magnetic Structure on the Width of the Ferromagnetic Resonance Line

dipole coefficient are of the same order as the coefficients themselves, i.e. $<\triangle D_{jk}^2>^{1/2} ~\sim~ 10^4 ~\rm Oe$

and that $J\sim 10^6$ Oe , sz ~ 10 and $\mu\sim 1$, then the half-width is found to be of the order of 10 Oe . This is in agreement with the experimental line width. Clogston's formula, on the other hand, yields a figure of less than 1 Oe

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AUTHORS:

Izyumov, Yu.A. and Polyak, Yu.Ya.

TITLE:

The s-d Exchange Interaction, and Resonance in

Ferromagnetic Metals

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pp.641~649

The properties of ferromagnetic metals and alloys of transition elements indicate that their magnetic properties are in the first instance associated with electrons in unfilled shells The exchange interaction of atoms with uncompensated spins. between these electrons and conduction electrons, i.e. the socalled s-d exchange interaction, has an important effect on Vonsovskiy et al their collective properties in a crystal. (Ref. 2 and 3) have shown that when the interaction with conduction electrons is taken into account, there appear two branches of spin In a further paper (Ref. 3) these workers investigated the damping of spin waves during their interaction with conduction This analysis is continued in the present paper with electrons.

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The s-d Exchange Interaction, and Resonance in Ferromagnetic Metals

special emphasis on the theory of ferromagnetic resonance. first part of the paper the complex magnetic susceptibility of a transition ferromagnetic metal is calculated as a function of the frequency of the external magnetic field. The Hamiltonian employed is that used by Vonsovskiy and Turov (Ref.4) and is given by Eq.(1.1) of the present paper. It consists of six terms. The first term contains the energy of a conduction electron $\mathbf{E}_{\mathbf{k}}$ corresponding to a quasi-momentum k, and the Fermi creation and annihilation operators ako and ako The second term represents the exchange energy of d-electrons, and the third and fourth terms the Zeeman energy of d- and s-electrons in a magnetic field. The last two terms give the s - d exchange operator. These two terms include the s-d exchange interval $J(k_1k_2)$. The Hamiltonian is used to calculate the susceptibility on the molecular field approximation and also by the methods of perturbation theory. It is shown that in the case of specimens whose dimensions are smaller than the depth of the skin layer, in Card 2/4

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The s-d Exchange Interaction, and Resonance in Ferromagnetic Metals

energy of two conduction electrons with the same quasi-momentum but different spin directions differs by 2sJ(kk). There are 9 references: 6 Soviet and 3 Non-Soviet.

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Exchange Interaction of Inner and Outer Electrons S/020/60/132/04/17/064 in Transition Metals B014/B007

spectrum of the d- and s-electrons. For this purpose the authors use the statistical Green function developed by N. N. Bogolyubov and S. V. Tyablikov (Ref. 7). The development of the distribution functions of the Bose- and Fermi particles is dealt with in detail, and formulas (11) and (12) are obtained. As turned out in the course of a further investigation, the exchange interaction between the outer and inner electrons leads to an exchange coupling between the inner electrons. As may be seen from formulas (18) and (19), this interaction has the character of a ferromagnetic coupling. If a direct d-d exchange of the inner electrons is lacking, this leads to ferromagnetism. Indirect interaction by conduction electrons leads only to the renormalization of the exchange integral and does not change the energy spectrum of the spin waves. Ye. A. Turov, Pu Fu-cho, T. Shiklosh, and D. N. Zubarev are mentioned. There are

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